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ABSTRACT

This paper focuses on the preparation for and development of a teacher education computer lab at Eastern Nazarene College (Massachusetts). Topics addressed include: (1) events leading up to the identification of the need for such a facility, including the authors' intense technology-based professional development experiences and the passing of the 1993 Education Reform Act by the Massachusetts Legislature; (2) communicating the need for the lab; (3) planning the design; (4) funding; (5) purchasing and installing the equipment; (6) managing the lab and responsibilities of the director; and (7) faculty orientation and training. Sixteen recommendations are provided for utilizing a computer lab in teacher education courses. (AEF)

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The Teacher Education Computer Lab: Planning, Development and Management

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The identification of the need for a teacher education computer lab at Eastern Nazarene College was rooted in (1) the authors' intense technology-based professional development experiences as registrants in the Lesley College M.Ed. Outreach Program in Computers in Education, (2) the authors' perceived need for a facility in which teacher education students could experience immediate technology applications of the content of their curriculum and methods courses, and (3) the passing of the 1993 Education Reform Act by the Massachusetts Legislature.

In the fall of 1992, the authors enrolled in the M.Ed. Outreach Program in Computers in Education located in Orleans, MA. Lesley College offers this program in various sites across the country. Instructors are practitioners in K-12 settings and Lesley full-time faculty. Throughout this program the authors became familiar with the many ways in which technology was being integrated into K-12 programs. They experienced, first hand, the powerful instructional impact of multimedia, the value of student-instructor e-mail capability, and the ways in which the Internet could be used as a valuable research tool in professional education and in all of the academic disciplines.

In 1993, Dr. Shopland was asked to teach the undergraduate and graduate courses in educational technology in the Division of Teacher Education at Eastern Nazarene College. After reviewing the "standard" course outline, it was apparent to her that the courses were in need of significant revision. Heretofore, the courses had treated the traditional "audio-visual" learning tools. It was essential that students and teachers of the 90's also become knowledgeable of the use of computer-based learning tools. During the '92 - '93 and '93 - '94 academic years, videos and journal articles were used to introduce students to the uses of computer-based learning tools.

Even these modifications proved inadequate preparation for tomorrow's teachers. Students and teachers also needed to become skillful in the use of computer-based learning tools. While all students had word processing and e-mail privileges in the Information Technology Systems Mac and PC labs located in the library, teacher education students required a facility in which they could learn the skills they would need as classroom teachers managing the use on in-classroom computers. These skills included learning how to (1) install programs, (2) access the control panels, (3) save to the hard drive, (3) handle minor trouble-shooting with their computers, (4) develop multimedia instructional materials, (5) use the Internet as a research tool, etc.

In addition they would also need to learn how to integrate computer-based learning tools with the K-12 curriculum. The concept of the teacher education computer lab was beginning to emerge.

The 1993 Education Reform Act, shaped and placed into law by politicians, had called for the integration of educational technology with the K-12 curriculum. This mandate would later serve as a significant factor in communicating to college administrators the need for a teacher education computer lab.

During the '95 - '96 academic year, two events occurred at ENC that provided momentum for the actualization of the concept of the lab. Professor Kannegieser was employed as an adjunct to assist with the teaching of graduate educational technology courses, which had grown in enrollment in the past three years from 10 students to 26. She worked closely with the Information Technology Department in making the ITS computer labs located in the library more user friendly for education students. Several pieces of educational software became available to students in the lab. Teacher education students were also provided with password access to the Internet. While teacher education students were now able to access computers for professional and course-related purposes, it was impossible for the authors to conduct class in the ITS public use labs.

The building momentum toward a teacher education computer lab was strengthened by the purchase of a $6,000 Proxima computer projector by the Mathematics and Computer Departments for use in their courses. The authors requested and were granted use of the projector in their

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courses in educational technology. The projector was very helpful in demonstrating educational software, teaching students how to use various tool programs, and how to navigate the Internet.

Communicating the Need for a Teacher Education Computer Lab

The course in educational technology was significantly revised in 1993 with a new text, videos focusing on computer-based learning tools, and assigned readings in current journals treating the integration of computers with the K-12 curriculum. The instructor's dissatisfaction with the lack of educational software and hardware to enable a much needed "hands on" instructional methodology motivated her to communicate with the key decision-makers regarding facilities and technology planning for the college. These decision-makers included the Chairman of the Division of Teacher Education, the Director of Information Technology Systems and the Vice President for Academic Affairs. The developing concept of a computer lab in which curriculum and methods courses could be taught was first brought to the chairman of the Division of Teacher Education. Fortunately, he was a self-taught computer user who was an e-mail and spreadsheet enthusiast. He accepted and supported the concept and referred Dr. Shopland to the college's Director of Information Technology Systems. Convincing the ITS Director of the value of such a unique instructional space was not an easy task. Certainly, he believed in the value of computers as learning tools. He was not easily convinced of the need for a computer lab designated for the exclusive use of teacher education courses, students and faculty. The key "selling point" for him was the evidence of a significantly growing market for professional development courses and programs in the greater Boston area, which was the direct result of the '93 Massachusetts Education Reform Act.

Once convinced of the need for the facility, the ITS Director has been a significant supporter of the work of the Education Division in regard to program development in educational technology. A meeting was held with the ITS Director, the Chairman of the Division of Teacher Education and all members of the education faculty to discuss the concept and affirm joint support for its actualization.

Planning the Teacher Education Computer Lab

The Director of ITS worked closely with Dr. Shopland in designing a technology-based instructional facility which could serve as a model in the greater Boston area. Included in the design was the equipment essential to host and participate in professional video studio conferencing and individual computer-based video conferencing. In addition, 15 multimedia computer stations, and a variety of peripherals would be purchased. The original plans were later modified in accord with actual funding.

Funding the Teacher Education Computer Lab

The momentum of administrative support had begun to grow. The Director of ITS worked with Dr. Shopland in developing a $240,000 grant proposal which was submitted, with a letter of support from the President, to a private foundation in the Spring of 1996. Unfortunately, the grant was not funded.

An unexpected letter from a local area kindergarten teacher arrived on the desk of the President in the spring of 1996. Introducing herself as an alumna of the college, she noted she was using five computers in her own classroom and was concerned about the college's preparation of future teachers in regard to their ability to effectively use computers in their classrooms. She further informed him that she had visited campus to learn about the college's efforts in this vital area of teacher preparation. She had been very disappointed to learn that little was being done to provide teacher education students with significant access to computers and current instructional software that they would be using in their K-12 classrooms. This letter "turned the tide" with regard to the college's interest in funding the project. By the fall of 1996, the Vice-President for Academic Affairs was planning to include the needed funds in the college budget for '96 - '97. However, he indicated he was considering allocating $25,000 in capital expenditures to equip a teacher education computer lab. We were pleased with the college's commitment, even though it represented only ten percent of the funds we deemed necessary to develop a "model technology-based environment."

Developing the Teacher Education Computer Lab

The Director of ITS, Dr. Shopland, and Prof. Kannegieser developed the following list of hardware to be purchased with funds that became available:

10 Power Macs
1 Hewlett Packard Laser Printer
1 Hewlett Packard DeskJet Color Printer
1 Apple Color Digital Camera
1 Apple Color Scanner
2 Connectix Quick Cam Video Cameras

Software purchases were severely limited by lack of sufficient funds. However, each system was preloaded with Claris 4.0 and ITS added Netscape and NCSA Telenet. Five copies of the Apple Elementary CD Resource Bundle and five copies of the Teacher CD Resource Bundle were purchased. Additional software purchases were limited to five additional copies of Hyperstudio and five copies of MicroWorlds.

Funds were not available to set-up a stationary instructor demonstration station which would include a computer projector. This is a significant limitation of the teacher

education computer lab at ENC. Instructors must use a portable demonstration station/projector available to all departments and scheduled via ITS. Unfortunately, reservation conflicts are not carefully monitored, and instructors cannot rely on the "reserved" availability of the college's only computer projector.

The teacher education computer lab was opened in the fall of 1996. During the first semester of conducting classes in the lab, it became apparent that each system should also be equipped with a Zip drive. The multimedia projects being developed by students required much more memory than the 1.4-MB available on a floppy disk.

Ten Zip drives were purchased and installed for the Spring Semester, 1997 and students were required to purchase a Zip cartridge. Spring Semester, 1997 students reported significantly greater lab-user satisfaction than did Fall Semester, 1996 students.

Managing the Teacher Education Computer Lab

The effective use of the teacher education computer lab by students and faculty is dependent upon effective management of the lab. The effective management of the lab requires an institutional financial commitment to fund the part-time or full-time position of Director of the Lab. The Director has many responsibilities including (1) scheduling open lab times, (2) scheduling of student lab assistants who monitor the lab during open lab times, (3) training of student lab assistants, (4) development and updating of the lab handbook, (5) follow-up with students regarding log entries noting hardware and software problems, (6) trouble shooting, (7) communication with individual instructors regarding their requests to use the lab and special programs, (8) installation of programs requested by individual instructors, (9) communication with facilities management regarding cleaning and appropriate maintenance of the lab, (10) communication with ITS to request additional technical assistance, and (11) monitoring legal uses of software in the lab.

Faculty Orientation to and Training in the Lab

Voluntary small group and individual orientation to and training in the lab has been provided. All faculty members have attended an initial session. A few faculty members have requested individual training in e-mail and the Internet. No faculty members have requested individual training in the use of multimedia and other tool programs. In addition, no faculty members have requested information related to instructional software that would be appropriate to the courses they teach. While faculty members have been supportive of the design and implementation of the lab, they have not utilized it as fully as was hoped. Faculty survey results have shown that the instructors who do use the lab extensively in their curriculum courses are also the instructors who teach the undergraduate and graduate courses in educational technology. In retrospect, it may have been wise to include the entire teacher education faculty in the planning of the computer lab. Their engagement in this process may have prompted them to develop a stronger commitment to more effectively utilizing the lab in their courses.

Recommendations for Utilizing a Computer Lab in Teacher Education Courses

The recommendations noted below are made in regard to the utilization of a computer lab in curriculum and methods classes, and all other teacher education courses.

In curriculum and methods courses, and other education courses, instructors may use the computer lab to:

1. demonstrate how to adapt a student's use of a particular piece of software to the learning styles and needs of various students,
2. engage students with a particular piece of software using a cooperative learning approach,
3. demonstrate how to integrate subject specific instructional software with a constructivist approach, discovery approach, investigative approach, or direct teaching approach,
4. introduce students to various pieces of instructional software to engage the learner's higher order cognitive skills,
5. introduce students to various pieces of instructional software to engage learners' multiple intelligences,
6. demonstrate various pieces of instructional software engage learners in the "process" of a specific discipline,
7. introduce students to various pieces of instructional software to facilitate the development of learner's writing, reading and speaking skills,
8. navigate the Internet with students,
9. demonstrate how to use the Internet as a research tool,
10. e-mail other professional educators who have published on the Internet,
11. conduct videoconferences with other educators,
12. enable students to share their research with classmates via e-mail,
13. enable students to provide each other with peer feedback regarding course projects,
14. develop K-12 multimedia instructional materials with students,
15. identify K-12 educators with similar professional concerns, and
16. assist students in publishing their own work on the Internet.

This is merely a beginning list of recommendations. Each instructor who makes a meaningful commitment to utilizing computer-based technology as a learning tool in

teacher education courses will be able to add many recommendations to this list.

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